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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/763,567	GILMANSHIN ET AL.
	Examiner	Art Unit
	KARLHEINZ R. SKOWRONEK	1631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6,8-13 and 18-57* is/are pending in the application.

4a) Of the above claim(s) *13,19,20,22,37 and 47-49* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,8-12,18,21,23-46 and 50-57* is/are rejected.

7)☒ Claim(s) *31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Status

Claims 1-4, 6, 8-13, and 18-57 are pending.

Claims 56 and 57 are new.

Claims 5, 7, and 14-17 are cancelled.

Claims 13, 19-20, 22, 37, and 47-49 are withdrawn as being directed to non-elected species, the restriction requirement made on 26 May 2006.

Claims 1-4, 6, 8-12, 18, 21, 23-46, and 50-57 have been examined.

Claims 1-4, 6, 8-12, 18, 21, 23-46, and 50-57 are rejected.

Claim 31 is objected to.

Priority

This application claims priority to provisional application no. 60/442,175 filed on 23 January 2003.

Claim Objections

Claim 31 is objected to because of the following informalities: Claim 31 recites the phrase “mirror images” in line 1-2 which is a typographical error and should recite “mirror image peaks”. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-4, 6, 8-12, 18, 21, 23-46, and 50-57 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-4, 6, 8-12, 18, 21, 23-46, and 50-57 are drawn to a process. A statutory process must include a step of a physical transformation, or produce a useful, concrete, and tangible result (State Street Bank & Trust Co. v. Signature Financial Group Inc. CAFC 47 USPQ2d 1596 (1998), AT&T Corp. v. Excel Communications Inc. (CAFC 50 USPQ2d 1447 (1999)). The instant claims do not result in a physical transformation, thus the Examiner must determine if the instant claims include a useful, concrete, and tangible result.

In determining if the claimed subject matter produces a useful, concrete, and tangible result, the Examiner must determine each standard individually. For a claim to be "useful," the claim must produce a result that is specific, and substantial. For a claim to be "concrete," the process must have a result that is reproducible. For a claim to be "tangible," the process must produce a real world result. Furthermore, the claim must be limited only to statutory embodiments.

Claims 1-4, 6, 8-12, 18, 21, 23-46, and 50-57 do not require production of a tangible result in a form that is useful to the user of the process. The process comprises obtaining intensity profiles, aligning individual intensity profiles, combining the aligned profiles to generate a population profile, selecting a peak in the population profile, combining individual profiles to generate a peak profile, and comparing the peak profile with the sample profile. A tangible result requires that the claim must set forth a practical application to produce a real-world result. This rejection could be overcome by

amendment of the claims to recite that a result of the process is outputted to a display, or to a user, or in a graphical format, or in a user readable format, or by including a result that is a physical transformation. The applicants are cautioned against introduction of new matter in an amendment.

Claims 1-4, 6, 8-12, 18, 21, 23-46, and 50-57 are directed to processes of analyzing polymer intensity data. The following analysis is taken from the guidance provided in the MPEP at 2104.IV, "Determine Whether the Claimed Invention Complies with 35 USC101". The claims are directed to processes. Here the claims are directed to the abstract idea of mathematical manipulations of data. The processes do not recite a physical transformation of matter from one state to another. Giving the claims the broadest reasonable interpretation, the claims read on mental steps. In *Comiskey* (*In re Comiskey*, 84 USPQ2d 1670) the court established that "the application of human intelligence to the solution of practical problems is not and of itself patentable" (at 1680). In *Comiskey*, the court stated explicitly "mental processes - or processes of human thinking - standing alone are not patentable even if they have a practical application" (at 1679). The court in *Comiskey* stated, "Following the lead of the Supreme Court, this court and our predecessor court have refused to find processes patentable when they merely claimed a mental process standing alone and untied to another category of statutory subject matter even when a practical application was claimed" (at 1680). In the instant claims, the process is not tied to a class of statutory invention.

Claims 1-4, 6, 8-12, 18, 21, 23-46, and 50-57 recite obtaining individual intensity data. The input is insignificant extra-solution activity and does not represent a significant

tie to another category of invention. The court in *Comiskey*, stated “the court rejected the notion that mere recitation of a practical application of an abstract idea makes it patentable, concluding that ‘[a] competent draftsman could attach some form of post-solution activity to almost any mathematical formula’” citing *Flook* (437 U.S. at 586, 590). The recent decision in *In re Bilski* confirmed the court’s position regarding insignificant pre- or post-solution activity (i.e. insignificant extra-solution activity) as stated in *Comiskey* (see *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008) at p. 13-96-1397). Applicant is encouraged to consider the recent BPAI informative decisions *Exparte Langemyr* (No. 2008-1495 (28 May 2008)) and *Exparte Biliski* (No. 2002-2257 (26 September 2006)) for further clarification of the above grounds of rejection.

Response to Arguments

Applicant's arguments filed 08 August 2008 have been fully considered but they are not persuasive. Applicant argues that the step of obtaining data is inherently a physical transformation. The argument is not persuasive. The claim does not recite a physical transformation. The term “obtaining data” is a broad term that may encompass but is not limited to physical transformations. For example, data may be “obtained" from a database without a physical transformation. The wherein clause reciting the data is obtained by detecting signals from individual polymers is a “product by process" limitation which serves to limit the type of data. The rejection of claims 1-4, 6, 8-12, 18, 21, 23-46, and 50-57 under 35 USC 101 as non-statutory is maintained.

Claim Rejections - 35 USC § 112

Response to Arguments

Applicant's arguments, see Remarks p. 13, filed 08 August 2008, with respect to the rejection of claims 1 and 55 as indefinite under 35 USC 112, Second Paragraph have been fully considered and are persuasive. The rejection of claims 1 and 55 has been withdrawn.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 6, 8-12, 18, 21, 23-46, and 50-57 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 29, 30, 32, and 55-57 are indefinite with respect to the individual intensity profiles. Claims 1, 29, 30, 32, and 55-57 recite the step of obtaining a plurality of individual intensity profiles and a step of storing the individual intensity profile. It is the disagreement the plural and singular cases of the term "profile" in the obtaining and storing steps of the claims that makes the claims indefinite. The metes and bounds of claims are indefinite because it is unclear which one of the pluralities of individual intensity profiles is stored. Claims 2-4, 6, 8-12, 18, 21, 23-28, 31, 33, 46, and 50-54 are also rejected because they depend from claims 1, 29, 30, 32, and 55-57, and thus contain the above issues due to said dependence.

Claim 56 is indefinite with respect to the term "the peak" in line 10. The claim recites at lines 9-10 a step of "selecting a peak in the sample population profile based on the presence of its mirror image peak in the population profile and obtaining

individual intensity profiles that contribute to the peak". The metes and bounds of claim 56 are indefinite because it is unclear which of the peaks, the selected peak or its mirror image, is used in the step.

Claim 32 recites the limitation "the oriented peak" in line20. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-4, 6, 8-12, 16-18, 21, 23-25, 26, 28, 44-45, 50-53, and 55-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al. (PG PUB 2003/0082538), in view of Chan (WO 98/35012), in view of Chan et al. (US PG PUB 2002/0039737) and in view of Sun (Pattern Recognition Letters Vol. 16, p. 987-996, 1995).

The claims are directed to a method for analyzing polymer intensity data from a sample comprising obtaining intensity profiles from individual labeled polymers contained in the sample, aligning individual intensity profiles from individual labeled polymers with respect to an alignment reference point, combining aligned individual intensity profiles to generate a population profile, selecting a peak in the population profile and obtaining individual intensity profiles that contribute to peak, combining individual intensity profiles that contribute to the peak to generate a peak profile, and comparing the peak profile with the population profile storing the intensity profile as a intensity vs. length profile. Further embodiments are drawn to the type of polymer, fluorescence data, labeling techniques, and data manipulations.

Claim 56 is directed to a method for analyzing polymer intensity data with the limitations of claims 1 and 25, but does not require an alignment profile that is a center of molecule reference point as in claim 1.

Claim 55 is directed to a method for analyzing polymer intensity data with the limitations of claims 1 and 28, but does not require an alignment profile that is a center of molecule reference point as in claim 1.

Taylor et al. teach a method of analyzing polymer populations in which intensity profiles from individual labeled polymers are obtained [0156]. The profiles are aligned with respect to an alignment reference point and combined to generate a sample population profile (fig. 16). Taylor shows selecting a peak in the sample profile and obtaining intensity profiles that contribute to the peak then combining the individual intensity profiles to generate a peak profile and comparing the peak profile with the sample profiles (fig 18 vs. fig16). Taylor show the peak profile consists of a subset of peaks from the sample profile (compare figure 16 to figure 18). Taylor shows storing intensity profiles as intensity vs. length profiles [0134 and 0156]. Taylor teaches that the sample can contain a heterogeneous mixture of polymers that are of different sizes/lengths [0134] and the mixtures of polymers have different sequences [0136]. Taylor teaches the sample is separated according to size prior the alignment [0134]. Taylor teaches that the intensity is fluorescence and profiles are fluorescence profiles [0156]. Taylor et al. teaches the polymers are embedded in a gel matrix [0232]. Taylor teaches a computer-implemented method (abstract, line 1-2). Taylor teaches the polymer is the nucleic acid, DNA [0030]. Taylor teaches the intensity profiles are obtained from individual polymers in flow [0127]. Taylor et al. show in figure 16, a sample profile that is an average of multiple profiles and in figure 17, a peak profile that is an average of multiple peak profiles.

Taylor does not show polymers labeled with sequence specific probes or an alignment reference point that is a center of molecule reference point. It is noted that the specification does not define the phrase “center of molecule reference point". The phrase is being interpreted as broadly as is reasonable.

Chan teaches a method for analyzing polymer intensity data from a sample. To accomplish the analysis, Chan obtaining fluorescence intensity data from a collection of labeled nucleotide polymers (p. 18, line 25-28, p. 11, line 32-34). The polymers can be labeled at specific sites or labeled randomly (p. 18, line 31-32). The random labeling reads on the further embodiments of sequence nonspecific labels. Chan describes the use of reference points to align profiles from individual polymers (p. 63, lines 25-31). Chan teaches intensity data from labeled polymers (p. 23, line 17-22). Chan teaches intensity profiles stored as intensity vs. length profiles (p. 68, lines 7-15). Chan defines the term “polymer specific feature” as any structural feature of a polymer which relates to its sequence, reading on the center of the polymer molecule which is a structural feature related to sequence (p. 76, line 2-3). In another embodiment, Chan teaches a method where the sample contains a heterogeneous mixture of polymers, differently sized fragments and with different sequences (p. 162, lines 8-9 and p. 74, lines 23-24). In another embodiment, Chan teaches a method where profiles are intensity versus length profiles and intensity is from fluorescence (p. 9, lines 9-13 and 33-35). In another embodiment, Chan teaches a method where the polymers are labeled with a sequence specific probe (p. 68, line 18 to p.69 line 1). In another embodiment, Chan teaches a method where the method is implemented on a computer (p. 58, lines 29-32). In another

embodiment, Chan teaches a method where the polymer is a nucleic acid that is DNA, and further genomic DNA (p. 8, lines 28-29). In another embodiment, Chan teaches a method where the reference point is an internal reference point and the reference point is a sequence specific probe (p.15, line 15-16). In another embodiment, Chan teaches a method where the polymers are in flow (col. 27, line 5-9). In another embodiment, Chan teaches a method where the population profile is an average population profile (p. 63, lines 18-24). In another embodiment, Chan teaches a method where polymers in the sample are sorted according to size prior to aligning individual intensity profiles (p. 119, line 35). In another embodiment, Chan teaches a method where the peak profile is an average peak profile (p. 40, line 31). In another embodiment, Chan teaches a method where peak is selected based on intensity (p. 40, lines 24-26). In another embodiment, Chan teaches a method where the polymer is completely stretched, partially stretched, or uniformly stretched (p. 101, lines 17-19). In another embodiment, Chan teaches a method where the peak is visible in an intensity vs. length profile (figs. 2 and 9). In another embodiment, Chan teaches a method where the peak corresponds to bin counts (p. 44, lines 6-7 and lines 11-12).

Chan et al. shows a process directed to characterizing individual polymers. Chan et al. shows that the center of a signal amplitude profile or the center of mass for a molecule can be a reference point, reading on a center of molecule reference point [0018]. Chan et al. shows that the signal amplitude profile is obtained when a labeled polymer moves relative to a detection zone [0017]. Chan et al. shows that a signal amplitude profile has a beginning, middle and end portions [0038]. The portions of the

signal amplitude profile correspond to polymer specific features. Chan et al. shows that an end-labeled polymer can enter the detection zone with either the labeled or unlabeled end as the leading edge [0083]. Thus, Chan et al. suggest that a profile of a single polymer may produce two signal amplitude profiles that are mirror images dependent on which end of the polymer enters the detection zone as the leading edge.

Sun shows a method of symmetry detection. Sun shows symmetry is prolific phenomena in the world (p. 987, col. 1). Sun shows that symmetry is good at describing shape and is a powerful concept facilitating object detection and recognition (p. 987, col. 2). Sun shows that if half of an image is mirror image of the other half, then one half need not be described suggesting flipping or inverting (p. 987, col. 2). Sun shows that center of mass can be used to determine the symmetry of an object (p. 993, col. 1 and figure 4).

It would have been obvious to one of skill in the art to modify the method of polymer analysis of Taylor et al. with the sequence specific probes of Chan because Chan shows by doing so the polymers labeled with sequence specific probes have a characteristic signature that allow the polymers to be identified from mixtures of similar polymer of different sequence, an advantage when testing mixtures of polymers. One of skill in the art would have been capable of applying sequence specific probes to a method of polymer analysis and the results would have been predictable to one of skill in the art. It would have been further obvious to one of ordinary skill in the art at the time of invention to modify the method of characterizing polymers of Taylor et al. in view of Chan with the reference point that is the center of a polymer molecule of Chan et al. and

the symmetry detection of Sun because the elongated polymers described in Taylor et al., Chan, and Chan et al. are symmetrical objects that have at least one axis of symmetry that lies at midpoint of the length and Sun shows that symmetry is good at describing shape and is a powerful concept facilitating object detection and recognition.

Claims 1, 27, 29-36, 38, 46 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al., in view of Chan, in view of Chan et al. and in view of Sun as applied to claims 1-4, 6, 8-12, 16-18, 21, 23-25, 26, 28, 44-45, 50-53, and 55-56 above, and further in view of Schwartz et al. (Science, Vol. 262, No. 5130, p. 110-114, 1993).

Claim 27 is directed to an embodiment in which a peak profile that resembles a population profile is a non-oriented profile.

Claim 57 is directed to a method for analyzing polymer intensity data with the limitations of claims 1 and 27, but does not require an alignment profile that is a center of molecule reference point as in claim 1.

Claim 29 is directed to a method for analyzing polymer intensity data with the limitations of claim 1 and claim 28, but does not require an alignment profile that is a center of molecule reference point as in claim 1. Claim 29 additionally inverts an oriented profile and adds the inverted oriented profile to the orient profile to generate a putative non-inverted profile which is compared to the population to determine that the peak profile is an oriented profile.

Claim 30 is directed to a method for analyzing polymer intensity data with the limitations of claim 1 and claim 28, but does not require an alignment profile that is a center of molecule reference point as in claim 1. Claim 30 additionally has the step of determining whether individual peaks in the peak profile have corresponding mirror image peaks in the population profile when the alignment reference point is a center of molecule reference point. It is noted that the step of “determining whether individual peaks in the peak profile have corresponding mirror image peaks in the population profile **when** the alignment point is a center of molecule reference point” is an optional step because the method does not require a center of molecule reference point. The claim is thus interpreted to mean that the optional determining step is only performed when the alignment point is a center of molecule reference point. In some embodiments the presence of corresponding mirror image peaks in a putative oriented profile indicates it is an oriented profile. In an embodiment the oriented profile is inverted and added to or combined with the oriented profile to generate a putative non-oriented profile which is compared to the population profile.

Claim 32 is directed to a method for analyzing polymer intensity data with the limitations of claim 1 and claim 28, but does not require an alignment profile that is a center of molecule reference point as in claim 1. Claim 32 additionally has the step of determining whether the oriented peak has a corresponding mirror image peaks in the population profile when the alignment reference point is a center of molecule reference point. It is noted that the step of “determining whether the oriented peak has a corresponding mirror image peak in the sample population profile **when** the alignment

reference point is a center of molecule reference point.” is an optional step because the method does not require a center of molecule reference point. The claim is thus interpreted to mean that the optional determining step is only performed when the alignment point is a center of molecule reference point. In some embodiments, intensity profiles are obtained that contribute to the mirror image peak and combining the intensity profiles that contribute to the mirror image peak to generate a mirror image peak profile. In some embodiments, the mirror image peak profile is compared to the population profile. In some embodiments, a step of determining if the mirror image peak profile is a mirror image of the peak profile. In some embodiments, a step of inverting and combining the mirror image peak profile with the peak profile provided the mirror image peak profile is a mirror image of the peak profile.

Taylor et al., in view of Chan, in view of Chan et al. and in view of Sun as applied to claims 1-4, 6, 8-12, 16-18, 21, 23-25, 26, 28, 44-45, 50-53, and 55-56 above shows a method of analyzing polymers.

Taylor et al., in view of Chan, in view of Chan et al. and in view of Sun as applied to claims 1-4, 6, 8-12, 16-18, 21, 23-25, 26, 28, 44-45, 50-53, and 55-56 above do not explicitly show that a peak profile that resembles a population profile is a non-oriented profile.

Schwartz et al. shows a method of optically mapping chromosomes from Saccharomyces cerevisiae. Schwartz produces a map of a chromosome by elongating the nucleic acid in a flow of molten agarose (p. 110, col. 3). The elongated nucleic acid is then optically imaged (p. 110, col. 3). From the image two related measurements can

made intensity and length (p. 111, col. 2). Schwartz et al. shows nucleic acids that have nearly symmetric maps can not be averaged to improve resolution unless one end is identified, so that map polarity must be established through ancillary means (p. 112, col. 1). The suggestion by Schwartz et al. to establish polarity or generate an “oriented profile” and the symmetric nature of nucleic acid which prevents optimal averaging (i.e. “non-oriented profile”) read on the determining and generating oriented and non-oriented profiles.

With respect to claims 29, 30, and 32, Taylor et al., in view of Chan, in view of Chan et al., in view of Sun and Schwartz et al. is applied as it is applied to claim 1.

It would have been further obvious to one of ordinary skill in the art at the time of invention to determine that a peak profile that resembles a population profile is a non-oriented profile in the population in the method of polymer analysis of Taylor et al. in view of Chan in view of Chan et al. in view of Schwartz et al. and in view of Sun. Both Chan et al. and Schwartz et al. suggest the ability of a polymer molecule being analyzed to be detected by either end of the polymer. Schwartz shows that nucleic acid symmetry prevents the improvement of resolution by averaging and could be solved by asymmetric labeling. Chan et al. shows that an end-labeled polymer can enter the detection zone with either the labeled or unlabeled end as the leading edge. Sun showed that an object’s center of gravity can be used to determine the axis of symmetry and facilitates the identification of the object. Thus, based on the teachings of Sun, Chan et al. and Schwartz et al., one of ordinary skill would have been guided to determine that a peak profile that resembles a population profile is a non-oriented

profile. With respect to the limitations of claim 29 directed to inverting an oriented profile and adds the inverted oriented profile to the orient profile to generate a putative non-inverted profile which is compared to the population to determine that the peak profile is an oriented profile. It would have been obvious to one of skill in the art to modify the method of polymer analysis of Taylor et al. with the sequence specific probes of Chan because Chan shows by doing so the polymers labeled with sequence specific probes have a characteristic signature that allow the polymers to be identified from mixtures of similar polymer of different sequence, an advantage when testing mixtures of polymers. One of skill in the art would have been capable of applying sequence specific probes to a method of polymer analysis and the results would have been predictable to one of skill in the art. It would have been further obvious to one of ordinary skill in the art at the time of invention to modify the method of characterizing polymers of Taylor et al. in view of Chan with the reference point that is the center of a polymer molecule of Chan et al. and the symmetry detection of Sun because the elongated polymers described in Taylor et al., Chan, and Chan et al. are symmetrical objects that have at least one axis of symmetry that lies at midpoint of the length and Sun shows that symmetry is good at describing shape and is a powerful concept facilitating object detection and recognition. It would have been further obvious one of ordinary skill in the art at the time of invention to invert a peak profile having a subset of peaks from the population and combine the inverted and peak profiles to generate a putative non-oriented profile which is compared to the population to verify that the peak profile is an oriented profile because the techniques of inversion or "reflection", combination and comparison of spectra, the

identification of oriented vs. non-oriented peak profile was recognized as part of the ordinary capabilities of one skilled in the art. One of ordinary skill in the art would have been capable of applying these known techniques to the method that was ready for improvement and the results would have been predictable to one of ordinary skill in the art.

Claims 1, 28, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al., in view of Chan, in view of Chan et al. and in view of Sun as applied to claims 1-4, 6, 8-12, 16-18, 21, 23-25, 26, 28, 44-45, 50-53, and 55-56 above, and further in view of Dousseau et al. (Applied Spectroscopy, Vol. 43, No. 3, p. 538-542, 1989).

Claim 39 is directed to subtracting the peak profile from the population profile.

Taylor et al., in view of Chan, in view of Chan et al. and in view of Sun as applied to claims 1-4, 6, 8-12, 16-18, 21, 23-25, 26, 28, 44-45, 50-53, and 55-56 above shows a method analyzing polymers.

Taylor et al., in view of Chan, in view of Chan et al. and in view of Sun as applied to claims 1-4, 6, 8-12, 16-18, 21, 23-25, 26, 28, 44-45, 50-53, and 55-56 above do not explicitly show the subtraction of spectra.

Dousseau et al. shows a process for subtracting spectra in the analysis of polymers by FT-IR. Dousseau et al. shows that the profile that results from water in a polymer FT-IR experiment can be subtracted from the sample profile to reveal the contributions of the polymer in the FT-IR profile (figure 2 and p. 540, col. 1). Dousseau

et al. the profile subtraction process has good reproducibility (p. 41, col. 1). Dousseau et al. shows that the process has the advantage of eliminating user bias encountered with interactive methods and takes into account baseline variations due to instrument drift (p. 542, col. 2).

It would have been obvious to one of ordinary skill in the art to modify the method of polymer analysis of Taylor et al., in view of Chan, in view of Chan et al. and in view of Sun as applied to claims 1-4, 6, 8-12, 16-18, 21, 23-25, 26, 28, 44-45, 50-53, and 55-56 above with the profile subtraction of Dousseau et al. because Dousseau et al. shows the process has the advantage of eliminating user bias encountered with interactive methods and takes into account baseline variations due to instrument drift.

Claims 40-41, and 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al., in view of Chan, in view of Chan et al., in view of Sun, and in view of Schwartz et al. as applied to claim 30-36, 38, and 46 above, and further in view of Dousseau et al.

Claim 54 is directed to subtracting profiles.

Claim 40 is directed to subtracting the mirror image peak profile from the sample population profile.

Claim 41 is directed to subtracting the peak profile and mirror image profile from the population.

Taylor et al., in view of Chan, in view of Chan et al., in view of Sun, and in view of Schwartz et al. as applied to claim 30-36, 38, and 46 above shows a method analyzing polymers.

Taylor et al., in view of Chan, in view of Chan et al., in view of Sun, and in view of Schwartz et al. as applied to claim 30-36, 38, and 46 above do not explicitly show the subtraction of spectra.

Dousseau et al. shows a process for subtracting spectra in the analysis of polymers by FT-IR. Dousseau et al. shows that the profile that results from water in a polymer FT-IR experiment can be subtracted from the sample profile to reveal the contributions of the polymer in the FT-IR profile (figure 2 and p. 540, col. 1). Dousseau et al. the profile subtraction process has good reproducibility (p. 41, col. 1). Dousseau et al. shows that the process has the advantage of eliminating user bias encountered with interactive methods and takes into account baseline variations due to instrument drift (p. 542, col. 2).

It would have been obvious to one of ordinary skill in the art to modify the method of polymer analysis of Taylor et al., in view of Chan, in view of Chan et al., in view of Sun, and in view of Schwartz et al. as applied to claim 30-36, 38, and 46 above with the profile subtraction of Dousseau et al. because Dousseau shows the process has the advantage of eliminating user bias encountered with interactive methods and takes into account baseline variations due to instrument drift.

Claims 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al., in view of Chan, in view of Chan et al., in view of Sun, and in view of Schwartz et al. as applied to claim 32-36 and 38 above, and further in view of Dousseau et al. as applied to claims 40-41 above, and further in view of Sievert (EP0437829).

Claim 42 is directed to the determination of additional peaks remaining after spectral subtraction.

Claim 43 is directed to presence of additional peaks being indicative of mixture of polymers in the sample.

Taylor et al., in view of Chan, in view of Chan et al., in view of Sun, and in view of Schwartz et al. as applied to claim 32-36 and 38 above, and further in view of Dousseau et al. as applied to claims 40-41 above shows a method of polymer analysis in which spectra are subtracted.

Taylor et al., in view of Chan, in view of Chan et al., in view of Sun, and in view of Schwartz et al. as applied to claim 32-36 and 38 above, and further in view of Dousseau et al. as applied to claims 40-41 above do not show the determination of additional peaks that are indicative of a mixture of polymers.

Sievert shows the subtraction of spectra to reveal additional peaks that are indicative of a mixture of polymers (p. 8). Sievert shows that profiles are characteristics of the compounds they represent and are compared to distinguish different compounds (p. 2).

It would have been obvious to one of ordinary skill in the art to modify the polymer analysis method of Taylor et al., in view of Chan, in view of Chan et al., in view

of Sun, and in view of Schwartz et al. as applied to claim 32-36 and 38 above, and further in view of Dousseau et al. as applied to claims 40-41 above with the determination of additional peaks that are indicative of a mixture of polymers of Sievert because all the claimed elements were known, in the prior art, and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention.

Conclusion

None of the claims are currently in condition for allowance.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARLHEINZ R. SKOWRONEK whose telephone number is (571) 272-9047. The examiner can normally be reached on 8:00am-5:00pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran can be reached on (571) 272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Examiner, Art Unit 1631

25 November 2008